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# A REVIEW OF *PTOUS* CHAMPION (COLEOPTERA: CURCULIONIDAE: CRYPTORHYNCHINAE)

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*Abstract.*—Three new species are described in the genus *Ptous*, ***P. cecropiae*, n. sp.**, ***P. woldai*, n. sp.**, and ***P. liebermanorum*, n. sp.**, and *P. otidocephalinus* Champion is redescribed. These species and at least three other undescribed forms can be separated into two groups. The species are illustrated and a key is provided. Two species have been reared from members of the plant genus *Cecropia* (Cecropiaceae), and a third has been collected on *Cecropia* as adults. Members of the genus *Ptous* are hypothesized to be part of a mimicry complex possibly based on the weevil genus *Myrmex* as Mullerian models.

*Key Words:* *Cecropia*, mimicry, *Myrmex*

The genus *Ptous* was described by Champion in 1906 for a single specimen from Nicaragua. In recent years collecting, ecological sampling, and rearing have yielded a number of additional specimens of at least seven different species. The present paper describes four of these as part of a more general study of insects associated with the plant genus *Cecropia* by one of us (L. M. LaPierre, in preparation).

The following collection acronyms are used throughout the text: BMNH: The Natural History Museum, London, England; CHAH: Henry A. Hespenheide, University of California, Los Angeles, CA, U.S.A.; CMNC: Canadian Museum of Nature, Ottawa, Canada; CWOB: Charles W. O'Brien, Tallahassee, FL, U.S.A.; INBC: Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica; STRI: Smithsonian Tropical Research Institute, Ancon, Panamá; USNM: National Museum of Natural History, Smithsonian Institution, Washington, DC, U.S.A.

*Ptous* Champion 1906: 632.

Type species.—*Ptous otidocephalinus* Champion, by monotypy.

Champion separated the genus *Ptous* on a combination of characters that make it very distinctive in the Cryptorhynchinae but which produce a strong superficial resemblance to members of the genus *Myrmex* (= *Otidocephalus*) in the Myrmecinae, a resemblance that is probably mimetic (see below). Species are relatively slender, narrowly obovate or ovate, and more or less strongly shining black and glabrous above with a relatively inconspicuous pattern of stripes and fasciae of white setae on the elytra. The third elytral interval is usually raised and denticulate near the base of the elytra, and the first (sutural), fifth and seventh intervals also may be raised or faintly carinate. The eyes are relatively large and narrowly separated along the middle, as in the Zygopinae, and the ocular lobes on the pronotum are poorly developed. The legs are relatively long and slender. Champion

placed *Ptous* between the genera *Trachalus* and *Cryptorrhynchus* but did not discuss its relationships with either. It is interesting that there are similarities of *Ptous* with *Cophes gibbus* Champion, which also has been reared from *Cecropia*.

Characters.—Species in the genus fall into two groups based on elytral pattern and form of the posterior tibiae. One group of species possesses an elytral pattern of a more or less complete lateral stripe on the sixth interval and a more or less well developed transverse subapical fascia, has the apical half of the first (sutural) interval raised and denticulate, and has the posterior tibiae terete and straight. The other group of species has an elytral pattern of broad oblique fasciae from the base of fifth elytral interval to the suture of the elytra, without a subapical fascia and with or without a submarginal stripe, and posterior tibiae that are flattened and weakly arcuate on their posterior margins. Species within these two groups differ in details of the setal patterns, the nature of the surface sculpture, and male genitalia.

### Key to Species of *Ptous*

1. Elytral pattern of oblique fasciae from base of fifth interval to suture at middle of elytron and then continuing parallel to suture, with lateral stripe, no subapical fascia; first (sutural) interval not raised or denticulate; posterior tibia flattened and weakly arcuate on posterior margin; Costa Rica . . . . . *P. liebermanorum*, n. sp.
– Elytral pattern of more or less complete stripe of setae on sixth interval parallel to lateral margin and transverse subapical fascia; apical half of the first (sutural) interval raised and denticulate; posterior tibia mostly terete and straight, laterally compressed only at base . . . . . 2
2. Posterior ⅕ of elytra almost completely covered by setae; sides of pronotum with setae to top of ocular lobes; tooth on anterior femora < 0.1 mm long, acute; Panamá . . . . . *P. woldai*, n. sp.
– Elytra with posterior transverse subapical fascia but with large glabrous area; sides of pronotum with setae only below ocular lobes; tooth on anterior femora > 0.1 mm long, acuminate . . . . . 3
3. Stripe of setae on sixth elytral interval incomplete; first (sutural) interval with setae only at apex and at posterior transverse fascia; fifth and seventh intervals not raised; Panamá . . . . . *P. cecropiae*, n. sp.
– Stripe of setae on sixth elytral interval complete; apical half of first (sutural) interval with stripe of setae; fifth and seventh intervals raised, faintly carinate; Nicaragua to Panamá . . . . . *P. otidocephalinus* Champion

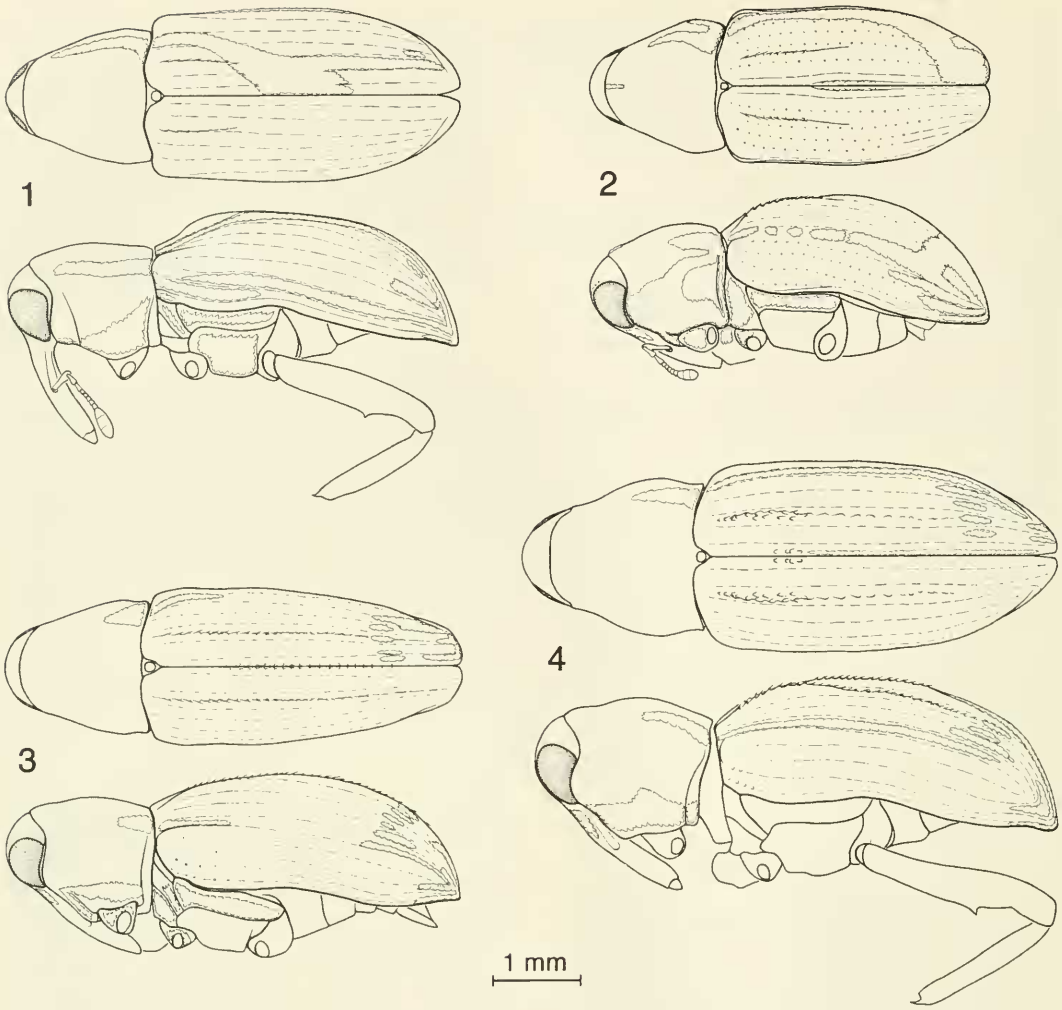
### *Ptous liebermanorum* Hespenheide and LaPierre, new species

(Figs. 1, 5)

Holotype male.—Black, moderately shining, relatively slender, slightly obovate; above glabrous except oblique stripe of small white setae from base of fifth elytral interval to third interval at about basal ⅓, continuing to apex, on first and second elytral intervals for middle ⅓, for entire length of ninth interval, basal ½ of tenth, apical ⅖ of eighth, and apical ⅙ of seventh interval; stripes of white setae on pronotum anterior to base of elytral stripes parallel to lateral margin reaching almost to apex; beneath and at base of rostrum with moderately dense white setae, somewhat condensed above anterior coxae, but glabrous above base of ocular lobes; legs with very small white setae, denser on dorsal and ventral surfaces; 5.0 mm long, 1.9 mm wide.

Head finely, densely punctate above, with eyes large, rather narrowly separated, rostrum 1.3 mm long, antennae inserted just above middle of rostrum. Pronotum 1.4 mm long slightly wider than long, widest just before base, sides weakly arcuate, weakly convex in cross section, nearly flat in lateral view, moderately densely, finely punctate. Elytron 3.2 mm long; somewhat matte, regularly convex, more weakly so in lateral view, basal ⅕ of third interval somewhat raised and minutely denticulate. Metasternum and first abdominal sternite very shallowly, broadly concave. Legs long, anterior femur with acute triangular tooth, posterior femur with tiny acute tooth, Aedeagus as in Fig. 5.

Allotype female.—As holotype, except metasternum and base of first abdominal sternite weakly convex, 6.8 mm long.




Figs. 1–4. Dorsal and lateral habitus and posterior tibia of species of *Ptous:* 1, *P. liebermanorum.* 2, *P. woldai.* 3, *P. cecropiae.* 4, *P. otidocephalinus.*

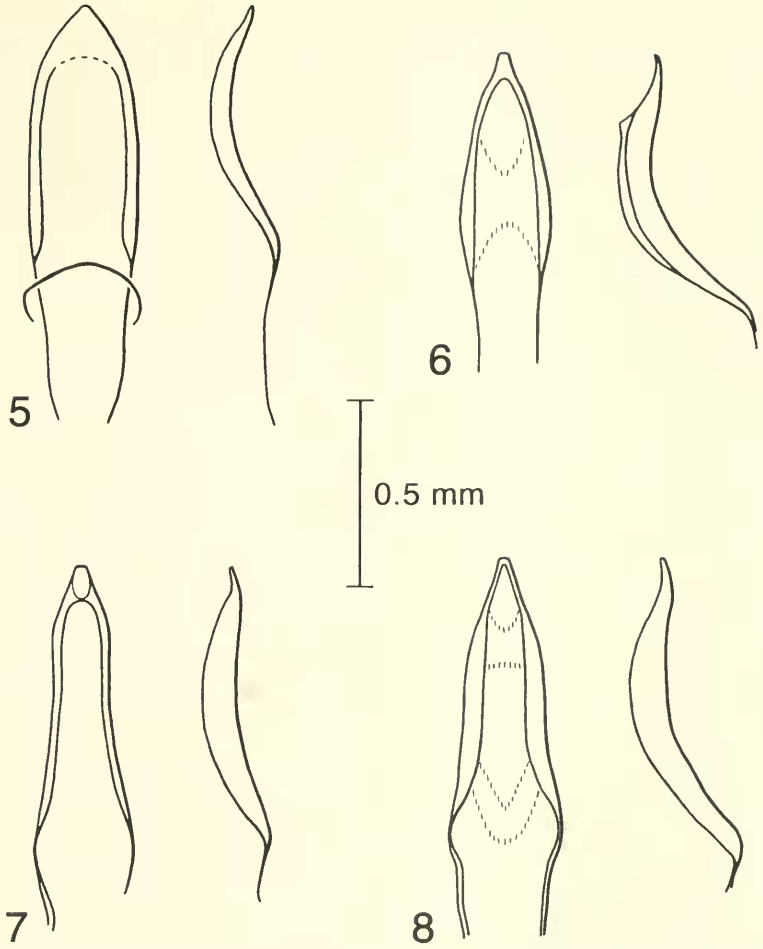
Holotype.—COSTA RICA: Heredia Pr., Est. Biol. La Selva, 50–150 m, 10°26′N 84°01′W, 09.11.1998, L.M. LaPierre, #98.277 (INBC).

Allotype.—Same data as holotype, except #98.277-1 (INBC).

Paratypes.—COSTA RICA: Alajuela Pr., 20 km S Upala, 01-20.11.1990, F.D. Parker (1, CWOB); Heredia Pr., same data as holotype, except #98.278.1; 24.01, 14.02, 03.2000, L.M. LaPierre, #00.649, 650, 651, reared from *Cecropia obtusifolia* wood (8, BMNH, CHAH, CWOB, USNM).

Discussion.—Specimens vary in size from 4.1–6.8 mm in length (mean = 5.52 mm, N = 12). In addition to this species, material has been seen that appears to represent three additional species of *Ptous* in the group with oblique elytral fasciae. Two of these species are from Panamá, one is from Bolivia. Each is represented by only a single female specimen, all in the collection of Charles W. O'Brien. We prefer to defer description of these until more material, including males, becomes available.

This species is dedicated to Drs. Milton and Diana Lieberman in warm appreciation of their generosity and advice to LML




Figs. 5–8. Male aedeagus of species of *Ptous*. 5, *P. liebermanorum*. 6, *P. woldai*. 7, *P. cecropiae*. 8, *P. otidocephalinus*.

while he worked at San Luis Biological Station.

### *Ptous woldai* Hespenheide and LaPierre, new species

(Figs. 2, 6)

Holotype male.—Black, moderately shining, relatively slender, slightly obovate; above glabrous except stripe of white setae on sixth elytral interval from base to apex and on apical ¼ of all other intervals; somewhat broad and irregular stripes of white setae on pronotum interior to base of elytral stripes, parallel to lateral margin reaching almost to apex and few white setae along mideline of pronotum at apex; white setae at base of rostrum and along midline of head above eyes; moderately dense white setae on sides of pronotum to top of ocular lobes, and on meso- and metasterna; abdominal sternites glabrous; legs with uniform white setae, denser on femora; 4.4 mm long, 1.7 mm wide.

Head finely, densely punctate above, with eyes large, rather narrowly separated, rostrum 1.0 mm long, antennae inserted just above middle of rostrum. Pronotum 1.25 mm long slightly wider than long, widest at basal ⅓, sides arcuate, weakly convex in cross section and in lateral view, moderately densely, finely punctate. Elytron 2.8 mm long; rather strongly shining, evenly convex

in lateral view, basal ¼ of third interval and apical ½ of first (sutural) interval raised and denticulate, fifth and seventh intervals raised, fifth more strongly so; coarsely punctate. Metasternum and base of first abdominal sternite very weakly, broadly concave. Legs moderately long, anterior femur with small acute triangular tooth, posterior femur with tiny acute tooth; posterior tibia terete, basally somewhat arcuate. Aedeagus as in Fig. 6.

Allotype female.—As holotype, except metasternum and base of first abdominal sternite weakly convex, 5.1 mm long.

Holotype.—PANAMÁ, Barro Colorado Is., UV trap 1 (3 m high), 09.07.1977, H. Wolda (CWOB).

Allotype.—Same data as holotype, except 13.04.1977 (CWOB).

Paratypes.—Same data as holotype, except 18, 22.10.1976, 13.04, 18, 27.05, 05.07.1977, 12.08.1978, 27.09.1981, 08.08.1983 (8, CWOB); same data as holotype, except UV trap 3 (26 m high), 21, 28.06, 14.07, 2, 3, 15, 16.08, 20.09, 6,20.09.1976, 20.03, 18, 23, 29.06, 19, 20.06, 07.07, 02, 17.11.1977, 24.04, 07, 23.05, 25.06, 04, 11.07, 23.11.1978, 10.091979, 04–05, 09.11.1980 (31, BMNH, CHAH, CWOB, STRI, USNM).

Discussion.—Specimens vary in size from 3.6–5.0 mm in length (mean = 4.22 mm, N = 40).

This species is named for Henk Wolda whose extensive sampling of insects on Barro Colorado Island (Wolda et al. 1998) and elsewhere in Panamá has been an important early step in the understanding of the biodiversity and seasonal phenology of Neotropical insects.

### *Ptous cecropiae* Hespenheide and LaPierre, new species

(Figs. 3, 7)

Holotype male: Black, strongly shining, relatively slender, narrowly ovate; above glabrous except stripe of white setae on basal ⅕ of sixth elytral interval and apical ¼ of second and fifth interval, and oblique transverse fascia at apical ⅕; small patches of white setae on pronotum just anterior to base of elytral stripes; beneath and at base of rostrum with moderately dense white setae, somewhat more condensed on sides, but glabrous above base of ocular lobes and on abdominal sternites; legs with very small white setae on tibiae and dorsal portions of middle and posterior femora; 5.0 mm long, 1.9 mm wide.

Head finely, densely punctate above, with eyes large, rather narrowly separated, rostrum 1.3 mm long, antennae inserted just above middle of rostrum. Pronotum 1.35 mm long slightly wider than long, widest at basal ⅓, sides rounded-angulate, weakly convex in cross section, nearly flat in lateral view, sparsely, finely punctate. Elytron 3.35 mm long; evenly convex, more weakly so in lateral view, basal ¼ of third interval and apical ¾ of first (sutural) interval raised and denticulate, fifth interval slightly raised. Metasternum and first abdominal sternite deeply, longitudinally concave. Legs long, anterior femur with long, acuminate tooth, posterior femur with shorter acuminate tooth; posterior tibia terete, basally somewhat laterally compressed. Aedeagus as in Fig. 7.

Allotype female.—As holotype, except metasternum flat and base of first abdominal sternite weakly convex, 6.8 mm long.

Holotype.—PANAMÁ, Chiriqui, Fortuna (08°44′N 82°15′W) 1,050 m, UV trap, 19.10.1976 (CWOB).

Allotype.—Same data as holotype, except 31.10.1977 (CWOB).

Paratypes.—PANAMÁ, Cocle Prov., Cerro Goital, 10-12.06.1985, E.G.Riley & D. Rider (1, CWOB); Panamá Prov., Cerro Campana, 05.07.1974, C.W. & L. O'Brien & Marshall (1, CWOB), Cerro Campana, 850 m, 08°40′N 79°56′W, 29.05.1970, H.A. Hespenheide, on *Cecropia* (1, CHAH), 29.04.1973, H.A. Hespenheide (1, BMNH), 08.02.1972, W. Bivin (1, CMNC).

Discussion.—Specimens vary in size from 3.9–6.3 mm in length (mean = 5.18 mm, N = 7).

The specific refers to the adult and putative larval host of this and other *Ptous*, species of plant genus *Cecropia*.

*Ptous otidocephalinus* Champion
1906: 633.
(Figs. 4, 8)

Diagnosis.—Female: Black, strongly shining, relatively slender, narrowly ovate; above glabrous except complete stripe of white setae on sixth elytral interval, on bases of fourth and fifth intervals, and along apical ⅔ of suture, and broad oblique transverse fasciae at apex and apical ⅕; narrow lines of white setae on pronotum anterior to base of elytral stripes; beneath and at base of rostrum with moderately dense white setae, somewhat more condensed on sides, but glabrous posterior to ocular lobes and on abdominal sternites; legs with very small white setae on tibiae and dorsal portions of femora; 5.4 mm long, 2.1 mm wide.

Head finely, densely punctate above, with eyes large, rather narrowly separated, rostrum 1.5 mm long, antennae inserted just above middle of rostrum. Pronotum 1.4 mm long slightly wider than long, widest at basal ¼, sides rounded-angulate, weakly convex in cross section, nearly flat in lateral view, sparsely, finely punctate. Elytra 3.7 mm long; evenly convex, more weakly so in lateral view, basal ⅕ of third interval and apical ¾ of first (sutural) interval raised and denticulate. Metasternum and first abdominal sternite weakly convex. Legs long, anterior femur with acute tooth, posterior femur with very small acute tooth; posterior tibia terete, basal ½ somewhat laterally compressed.

Male.—As female, except metasternum and base of first abdominal sternite deeply, longitudinally concave. Aedeagus as in Fig. 8.

Specimens examined.—COSTA RICA: Puntarenas Pr., San Luis de Monteverde & vic., 1,000–1,200 m, 10°17′N 84°49′W, 19.08.1998, L.M. LaPierre, #San97.93-01-20 (CHAH, USNM, INBC), 1,100–1,400 m, 21-25.07, 02-09.08.1996, L.M.La Pierre, *Cecropia* (CHAH); Heredia Pr., Est. Biol. La Selva, 50–150 m, 10°26′N 84°01′W, 09.11.1998, L.M. LaPierre, #98.278.2; 24.01, 14.02, 02, 03, 09.05.2000, L.M. LaPierre, #00.649, reared from *Cecropia obtusifolia* wood (8, BMNH, CHAH). NICARAGUA, Granada, Sallé (holotype, BMNH). PANAMÁ: Chiriqui, 1300 m., Alto Lino nr. Boquete, UV trap, 25.05.1977, 19.04.1978, H. Wolda (CWOB).

Discussion.—*Ptous otidocephalinus* is very similar to *P. cecropiae*, but can be separated by differences in the male genitalia and the characters given in the key. Specimens vary in size from 4.2–5.9 mm in length (mean = 5.05 mm, N = 36). The holotype is a female.

## Ecology of *Ptous*

Species of *Ptous* were reared by LaPierre as part of a general survey of wood-boring and other insects feeding on members of the Cecropiaceae at La Selva Biological Station and at San Luis de Monteverde, both in Costa Rica. Branches with maximum basal diameter of about 15 cm were clipped from mature trees of *Cecropia obtusifolia* Bertoloni (La Selva and San Luis) and *C. insignis* Liebmann, *Coussapoa villosa* Poeppig and Endlicher, and *Pourouma bicolor scobina* (Benoist) C.C. Berg and van Heusden (all at La Selva only) and left below the trees from which they were cut. After two months sections of the branches were removed and placed in rearing containers; sections were 30–40 cm in length and represented a range of diameters from 4–15 cm.

*Ptous liebermanorum* and *P. otidocephalinus* were reared from branches of *Cecropia obtusifolia* and *C. insignis* at La Selva, and *P. otidocephalinus* from *C. obtusifolia* at San Luis. Concurrent rearings from the other genera of the Cecropiaceae at La Selva (*Coussapoa, Pourouma*) did not produce any *Ptous* although other species of Coleoptera were shared among the samples. Based on these rearing data and hand col-

lections of adults, it appears that *Ptous* is a specialist on senescing wood of *Cecropia* species.

Virtually all specimens of *Ptous* we have seen for which there is collection data have been either reared from or collected on *Cecropia* or have been collected in UV light traps. It is interesting that no specimens of *Ptous* have been collected by the general sampling methods (Malaise traps, canopy foggings, UV light traps) of the Arthropods of La Selva (ALAS) Project. Although species of *Cecropia* have not been among the species fogged, other samples have been taken over a range of habitats at La Selva, and *Cecropia* species are widely distributed among these habitats. *Cecropia* specialists in other weevil genera (*Lechriops, Lissoderes, Pseudolechriops*) have been collected in standardized samples, however.

Other cryptorhynchine weevils reared from *Cecropia* by LaPierre include *Coelosternus variisquamis* (Champion) and *Cophes gibbus* Champion. A complete summary of the results of these rearings will appear elsewhere (LaPierre, in preparation).

## *Ptous* and Mimicry

Champion (1906) named *Ptous otidocephalinus* for its striking resemblance to species of *Otidocephalus* (= *Myrmex*). The senior author has suggested elsewhere (Hespenheide 1987, 1995) that this resemblance is a case of mimicry and that it involves a number of other taxa, including other species in several subfamilies of the Curculionidae, Buprestidae, Cleridae, and Rhynchitidae. It is possible that species of *Myrmex* are in fact the distasteful models for this system, in view of their species richness and relative commonness, but no experimental feeding trials have been made to support this hypothesis. It is interesting that both *Ptous* and the zygopine weevil *Lissoderes* share this habitus (Hespenheide 1987) and that both use *Cecropia* species as hosts. Just as restriction of a species' activity affects its ability to be sampled by generalized sampling methods (see above), microhabitat is also important to the effectiveness of mimicry (Hespenheide 1996).

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Chris Lyall and Sharon Shute assisted during a visit to The Natural History Museum, London. Charles W. O'Brien shared expertise and generously loaned material from his personal collection. LML is grateful to Kirsten Querbach for the help she affably provided in monitoring rearing containers at San Luis and to Pamela Wright for comments on the manuscript. Fieldwork by LaPierre at La Selva and San Luis was supported by a fellowship from the Department of Organismic Biology, Ecology and Evolution, UCLA. Hespenheide has been supported through the ALAS Project at La Selva (National Science Foundation grants BSR 9025024, DEB 9401069, DEB 9706976, and DEB-0072702) and grants from the UCLA Academic Senate. Both authors also were supported by personal funds. Margaret Kowalczyk prepared the figures.

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